

REMARKS

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page are captioned "**Version with Markings to Show Changes Made.**"

Claims 1-13 remain in this application.

Claims 1-13 have been rejected under the judicially created doctrine of double patenting of the obviousness kind over claims 1-12 of U.S. Patent No. 6,407,279 (hereafter Buchanan et al.).

Applicants respectfully point out that the double patenting rejection is improper because the instant claims are not obvious over Buchanan et al.

Buchanan et al. discloses a process in which the first reaction, i.e., the reaction of the alkylene oxide with carbon dioxide, is carried out in the presence of a carbonation catalyst and the second reaction, i.e., the reaction of the alkylene carbonate with an alcohol, is carried out in the presence of a trans-esterification catalyst.

In contrast, the instant claims define a process in which the first reaction (i.e., the reaction of the alkylene oxide with carbon dioxide) and the second reaction (i.e., the reaction of the alkylene carbonate with an alcohol) are both carried out in the presence of a carbonation catalyst.

The preferred carbonation catalysts are homogeneous and are used in both reaction zones of the process. They include compounds such as those described on page 11, lines 9-24:

"In the first aspect of the present invention a homogeneous carbonation catalyst is used in both reaction zones of the process. In the first reaction zone of the first aspect, the reactants (i.e., alkylene oxide and carbon dioxide) are contacted in the presence of a homogeneous catalyst. The homogeneous carbonation catalyst is preferably a neutral or basic homogeneous carbonation catalyst which provides adequate reaction kinetics for both the carbonation reaction and transesterification reaction. More preferably, the homogeneous carbonation catalyst contains a basic component and a halide containing component, wherein the basic component is selected from the group consisting of carbonates, bicarbonates, acetates, amines, phosphines and mixtures thereof and the halide containing component is selected from the group consisting of alkali halides, quaternary ammonium halides and mixtures thereof. Examples of suitable homogeneous catalysts include an alkali or quaternary ammonium halide; basic materials, preferably selected from an alkali, alkali earth, transition metal or quaternary ammonium carbonate, bicarbonate, hydroxide or acetate; an organic amine or phosphine; or mixtures of these materials.

Thus, the instant process employs only a carbonation catalyst and does not require the use of a trans-esterification catalyst. There is no teaching or suggestion in Buchanan et al. that a carbonation catalyst can be used alone in both reaction zones of the process. Accordingly, the instant claims are not obvious over Buchanan et al. Therefore, the double patenting rejection is improper because and, as such, should be withdrawn.

Claims 1-13 have also been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,434,105 (hereafter Buysch et al.), Chem Systems "Developments in Dimethyl Carbonate Production Technologies," 99/00S6, May 2000 (hereafter Chem Systems) and U.S. Patent No. 6,407,279 (hereafter Buchanan et al.), each taken alone or in combination with each other.

Buysch et al. discloses thallium-catalyzed process. It does not teach or suggest that the process can be carried out without the use of a thallium catalyst. The process described by Buysch et al. requires the use of a thallium catalyst. (see, for example, claim 1 of Buysch et al.). In contrast, the instant process employs only a carbonation catalyst and does not require a thallium catalyst.

Further, Buysch et al. discloses that the first step reaction is conducted in the presence of a bifunctional halide/lewis acid catalyst at pressures below 10 bar and the second reaction is conducted in the presence of the same bifunctional halide/lewis acid catalyst under autogenous pressure. However, there are problems associated with using such a process on an industrial scale. The problems include long reaction times for the first step reaction between the alkylene oxide and CO₂, high corrosivity of many Lewis acids, thus making the process unattractive for use on an industrial scale.

Accordingly, the instant claims are not obvious over Buysch et al. Therefore, the obviousness rejection under 35 U.S.C. §103(a) should be withdrawn.

Chem Systems has only general descriptions of several processes. Chem Systems discloses that the first stage of the process, i.e., the reaction of the alkylene oxide with carbon dioxide, is carried out in the presence of a carbonation catalyst, such as, TEAB, and the second reaction, i.e., the reaction of the alkylene carbonate with an alcohol, is carried out in the presence of a trans-esterification catalyst, such as, sodium ethylate.

Chem Systems neither has a specific description of the steps of the instantly claimed process nor does it teach that a carbonation catalyst alone can be used alone in both reaction zones of the process. Accordingly, the instant claims are not obvious over Chem Systems.

Therefore, the obviousness rejection under 35 U.S.C. §103(a) should be withdrawn.

Buchanan et al. discloses a process in which the first reaction, i.e., the reaction of the alkylene oxide with carbon dioxide, is carried out in the presence of a carbonation catalyst and the second reaction, i.e., the reaction of the alkylene carbonate with an alcohol, is carried out in the presence of a trans-esterification catalyst.

In contrast to Buchanan et al., the instant claims define a process in which the first reaction (i.e., the reaction of the alkylene oxide with carbon dioxide) and the second reaction (i.e., the reaction of the alkylene carbonate with an alcohol) are both carried out in the presence of a carbonation catalyst. The same carbonation catalyst is used in both reaction zones of the process.

The instant process employs only a carbonation catalyst and does not require the use of a trans-esterification catalyst. There is no teaching or suggestion in Buchanan et al. that a carbonation catalyst can be used in both reaction zones of the process without the use of a trans-esterification catalyst. Accordingly, the instant claims are not obvious over Buchanan et al. Therefore, the obviousness rejection under 35 U.S.C. §103(a) should be withdrawn.

Furthermore, any combination of the these references does teach or suggest all the limitations of the instantly claimed process including:

- (1) reacting an alkylene oxide with carbon dioxide in the presence of a homogeneous carbonation catalyst;
- (2) at a temperature in the range of about 50 to 250 °C;
- (3) at a pressure of at least about 1379 kPa (200 psi); and
- (4) reacting the cyclic carbonate with an aliphatic monohydric alcohol in the presence of the homogeneous carbonation catalyst.

Accordingly, rejection of claims 1-13 under 35 U.S.C. §103(a) as being unpatentable over Buysch et al., Chem Systems and Buchanan et al., each taken alone or in combination with each other, should be withdrawn and claims 1-13 should be allowed.

Applicants respectfully request reconsideration of the present application, withdrawal of the double patenting rejection and the 35 U.S.C. 103(a) rejections of claims 1-13 and allowance of the all pending claims. Accordingly, an early indication of their allowability by issuance of a Notice of Allowability is earnestly solicited.

Respectfully submitted,

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By:



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claims 14-54 were cancelled without prejudice.